

**AMENDMENTS TO THE CLAIMS**

1. (Currently amended) A microphone system for communication devices comprising:
  - a. a first omnidirectional microphone element;
  - b. a second omnidirectional microphone element positioned near the first microphone element; and
  - c. a signal flow processor electrically connected to the first and second microphone elements;

wherein the signal flow processor provides an electrical time delay only to the first microphone element, such that the first microphone element's output undergoes a phase change substantially equal to that which a coupling acoustical traveling wave undergoes between the time the wave arrives at the first microphone element and subsequently arrives at the second microphone element, and provides a compatible amplitude gain only to the second microphone element, such that the second microphone's output undergoes an amplitude gain substantially equal in magnitude to the amplitude attenuation which the wave undergoes between the time the wave arrives at the first microphone element and subsequently arrives at the second microphone element, and wherein the signal flow processor only subtracts the outputs of the first and second microphone elements to create a null that reduces external acoustic coupling.

2. (Cancelled).
3. (Original) The microphone system of claim 1, wherein a first input sound port leads into the first microphone element and a second input sound port leads into the second microphone element.

4. (Original) The microphone system of claim 3, wherein the first and second input sound ports each comprise a sound input port of a mobile phone.
5. (Original) The microphone system of claim 4, wherein the mobile phone comprises a receiver positioned and located closer to the first input sound port than the second input sound port.
6. (Original) The microphone system of claim 5, wherein the signal flow processor makes the amplitude gain equal to unity and the time delay is selected from a range between 0 and a value equal to  $d_2/c$ , wherein the variable " $d_2$ " equals the distance between the first and second sound ports and the variable " $c$ " equals approximately the speed of sound.
7. (Original) The microphone system of claim 5, wherein the electrical time delay (" $\tau$ ") is equal to  $\tau = (w-u)/c$ , wherein the variable " $w$ " equals the distance between the receiver and the second sound port, the variable " $c$ " equals approximately 345,000 millimeters per second, and the variable " $u$ " equals  $\sqrt{w^2 + d_2^2 - 2 d_2 w \cos(\kappa - \Psi)}$  with the variable " $d_2$ " being equal to the distance between the first and second input sound ports, with the variable " $\kappa$ " being equal to the angle of an ear reference point adjacent to the receiver and the second input sound port, and with the variable " $\Psi$ " being equal to the angle of the first input sound port and the second input sound port.
8. (Original) The microphone system of claim 7, wherein compatible amplitude gain (" $G_{m1}$ ") is equal to  $G_{m1} = (w/u)$ .
9. (Original) The microphone system of claim 3, wherein the first and second input sound ports each comprise an input sound port of a speakerphone, wherein the speakerphone comprises a

loudspeaker with its center located and positioned closer to the first input sound port than the second input sound port.

10. (Original) The microphone system of claim 9, wherein the signal flow processor makes the amplitude gain equal to unity and the time delay is selected from a range between 0 and a value equal to  $d_2/c$ , wherein the variable " $d_2$ " equals the distance between the first and second sound ports and the variable " $c$ " equals approximately the speed of sound.

11. (Original) The microphone system of claim 10, wherein the electrical time delay (" $\tau$ ") is equal to  $\tau = (w-u)/c$ , wherein the variable " $w$ " equals the distance between the center of the loudspeaker and the second sound port, the variable " $c$ " equals approximately 345,000 millimeters per second, and the variable " $u$ " equals  $\sqrt{w^2 + d_2^2 - 2 d_2 w \cos (\kappa - \Psi)}$  with the variable " $d_2$ " being equal to the distance between the first and second input sound ports, with the variable " $\kappa$ " being identically equal to 0, and with the variable " $\Psi$ " being equal to the angle of the first input sound port and the second input sound port.

12. (Original) The microphone system of claim 11, wherein compatible amplitude gain (" $G_{m1}$ ") is equal to  $G_{m1} = (w/u)$ .

13. (Currently Amended) A method for producing a null towards an acoustical driver of a communication device for reducing external acoustic coupling in the communication device, the method comprising the steps of:

a.—providing a microphone system for telecommunications having

(i) a first omnidirectional microphone element having a first output; and

(ii) a second omnidirectional microphone element positioned near the first microphone element, the second microphone element having a second output;

- (iii)a signal flow processor electrically connected to the first and the second microphone elements;
- b. ~~utilizing the signal flow processor to provide~~providing an electrical time delay only to the first output, such that the first output undergoes a phase change substantially equal to that which a coupling acoustical traveling wave undergoes between the time the wave arrives at the first microphone element and subsequently arrives at the second microphone element;
- e. ~~utilizing the signal flow processor to provide~~providing an amplitude gain only to the second output, such that the second output undergoes an amplitude gain substantially equal in magnitude to the amplitude attenuation which the wave undergoes between the time the wave arrives at the first microphone element and subsequently arrives at the second microphone element; and
- d. ~~utilizing the signal flow process to only subtract~~subtracting the first output from the second output to create a null that reduces external acoustic coupling.
14. (Original) The method of producing a null of claim 13, wherein the method further comprises the step of providing a mobile phone having a first input sound port leading into the first microphone element, a second input sound port leading into the second microphone element, and wherein the acoustical driver comprises a receiver positioned and located closer to the first input sound port than the second input sound port.
15. (Original) The method of producing a null of claim 14, wherein the method further comprises the step of calculating the electrical time delay("τ") with the formula  $\tau = (w-u)/c$ , wherein the variable "w" equals the distance between the receiver and the second sound port, the variable "c" equals approximately 345,000 millimeters per second, and the variable "u" equals  $\sqrt{w^2 + d_2^2} - 2$

$d_2 w \cos (\kappa - \Psi)]$  with the variable " $d_2$ " being equal to the distance between the first and second input sound ports, with the variable " $\kappa$ " being equal to the angle of an ear reference point that is adjacent to the receiver and the second input sound port, and with the variable " $\Psi$ " being equal to the angle of the first input sound port and the second input sound port.

16. (Original) The method of producing the null of claim 15, wherein the method further comprises the step of calculating the compatible amplitude gain (" $G_{m1}$ ") with the formula  $G_{m1} = (w/u)$ .

17. (Original) The method of producing the null of claim 14, wherein the method further comprises the step of calculating the electrical time delay and compatible amplitude gain by driving the receiver with an electrical impulse and measuring the impulse response at both the locations of the first and second microphone element outputs.

18. (Original) The method of producing the null of claim 13, wherein the method further comprises the step of providing a speakerphone having a first input sound port leading into the first microphone element, a second input sound port leading into the second microphone element, and wherein the acoustical driver comprises a loudspeaker positioned and located closer to the first input sound port than the second input sound port.

19. (Original) The method of producing a null of claim 18, wherein the method further comprises the step of calculating the electrical time delay (" $\tau$ ") with the formula  $\tau = (w-u)/c$ , wherein the variable " $w$ " equals the distance between the loudspeaker center and the second sound port, the variable " $c$ " equals approximately 345,000 millimeters per second, and the variable " $u$ " equals  $\sqrt{w^2 + d_2^2 - 2 d_2 w \cos (\kappa - \Psi)}$  with the variable " $d_2$ " being equal to the distance between the first and second input sound ports, with the variable " $\kappa$ " being identically equal to zero, and with

the variable " $\Psi$ " being equal to the angle from the second input sound port to the first input sound port.

20. (Original) The method of producing the null of claim 19, wherein the method further comprises the step of calculating the compatible amplitude gain (" $G_{m1}$ ") with the formula  $G_{m1} = (w/u)$ .

21. (Original) The method of producing the null of claim 18, wherein the method further comprises the step of calculating the electrical time delay and compatible amplitude gain by driving the loudspeaker with an electrical impulse and measuring the impulse response at both the locations the first and second microphone element outputs.

22. (Original) The method of producing the null of claim 14, wherein the electric time delay and compatible amplitude gain are each equal to a constant value with a finite number of discrete sub-bands across the communications band.

23. (Original) The method of producing the null of claim 18, wherein the electric time delay and compatible amplitude gain are each equal to a constant value within a finite number of discrete sub-bands across the communications band.

24. (Cancelled).

25. (Cancelled).